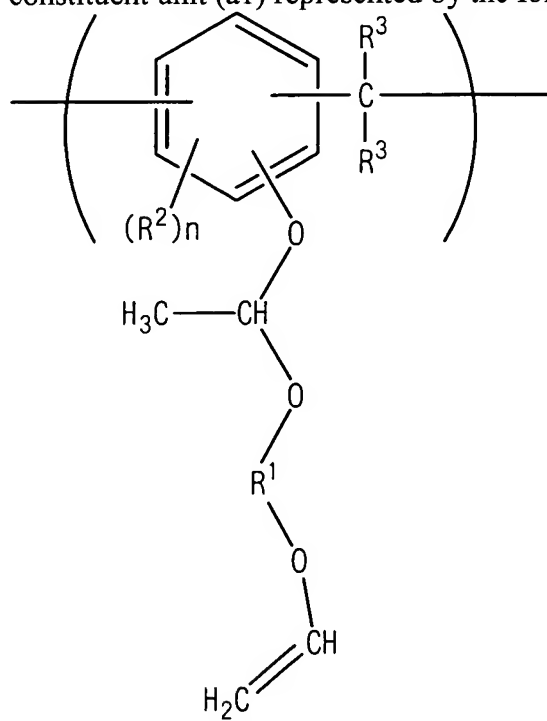


# LISTING OF THE CLAIMS

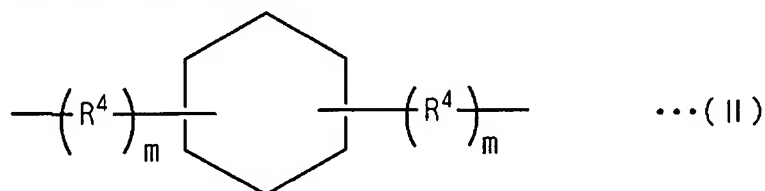
No Claims are currently amended

1. **(Original)** A chemical amplification type positive photoresist composition prepared by dissolving:

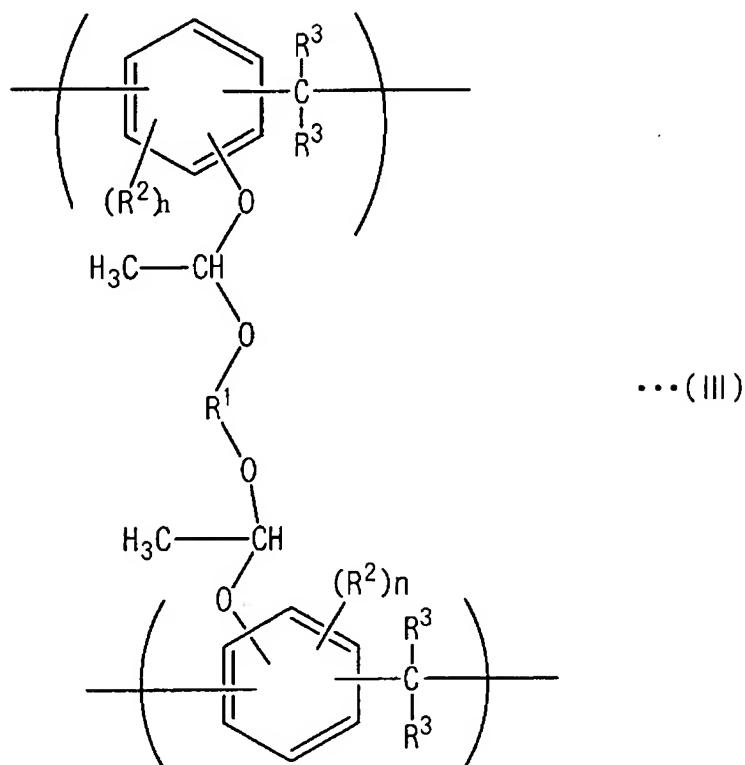
(A) a slightly alkali-soluble or alkali-insoluble novolak resin having a property that solubility in an aqueous alkali solution is enhanced in the presence of an acid, comprising either or both of a constituent unit (a1) represented by the following general formula (I):



wherein  $R^1$  represents either an alkylene group having 1 to 10 carbon atoms which may have a substituent or a group represented by the following general formula (II):



(wherein  $R^4$  represents an alkylene group having 1 to 10 carbon atoms which may have a substituent and  $m$  represents 0 or 1), the alkylene group may have an oxygen bond (ether bond) in the main chain,  $R^2$  and  $R^3$  each independently represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, and  $n$  represents an integer of 1 to 3, and an intermolecular crosslinked moiety (a2) represented by the following general formula (III):



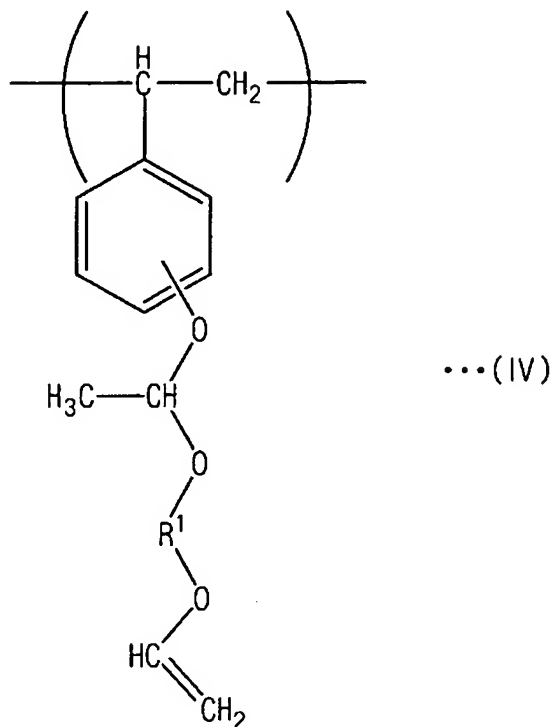
wherein  $R^1$  represents either an alkylene group having 1 to 10 carbon atoms which may have a substituent or a group represented by the above general formula (II) (wherein  $R^4$  represents an alkylene group having 1 to 10 carbon atoms which may have a substituent and  $m$  represents 0 or 1), the alkylene group may have an oxygen bond (ether bond) in the main chain,  $R^2$  and  $R^3$  each independently represents hydrogen atom or alkyl group having 1 to 3 carbon atoms, and  $n$  represents an integer of 1 to 3; and

(B) a compound generating an acid under irradiation with radiation, in an organic solvent, wherein the content of an acid component is 10 ppm or less.

2. **(Original)** A chemical amplification type positive photoresist composition prepared by dissolving:

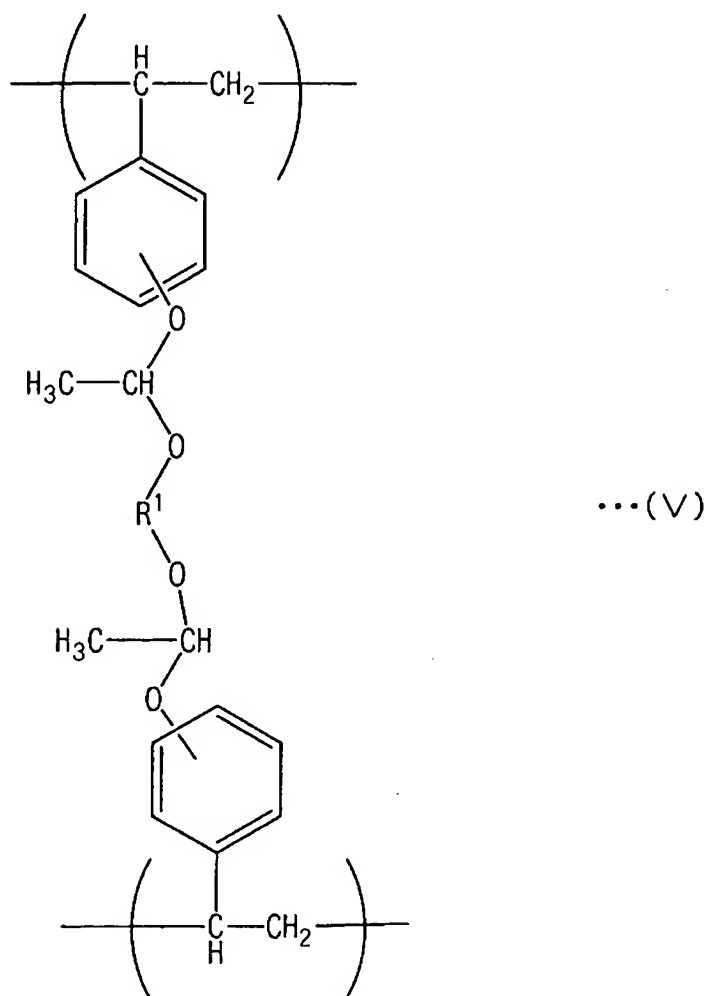
(A') an slightly alkali-soluble or alkali-insoluble polyhydroxystyrenic resin having a property that solubility in an aqueous alkali solution is enhanced in the presence of an acid, comprising either

or both of a constituent unit (a'1) represented by the following general formula



(IV):

wherein  $R^1$  represents either an alkylene group having 1 to 10 carbon atoms which may have a substituent or a group represented by the above general formula (II) (wherein  $R^4$  represents an alkylene group having 1 to 10 carbon atoms which may have a substituent and  $m$  represents 0 or 1), the alkylene group may have a oxygen bond (ether bond) in the main chain, and an intermolecular crosslinked moiety (a'2) represented by the following general formula (V):

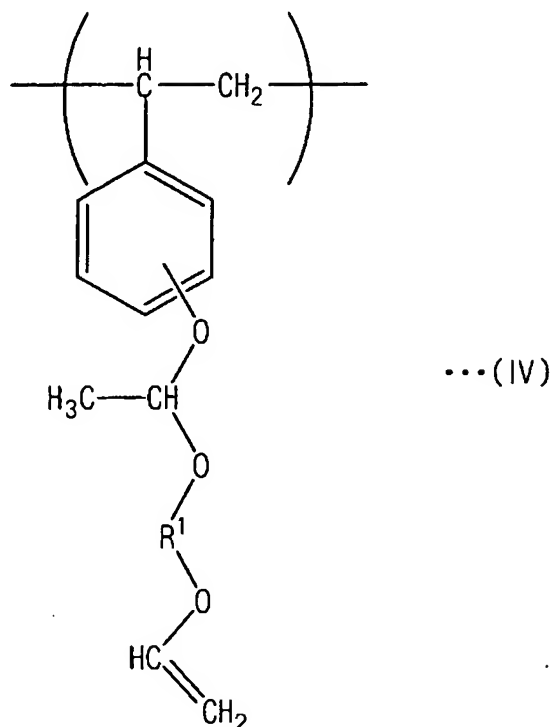


wherein  $R^1$  represents either an alkylene group having 1 to 10 carbon atoms which may have a substituent or a group represented by the above general formula (II) (wherein  $R^4$  represents an alkylene group having 1 to 10 carbon atoms which may have a substituent and  $m$  represents 0 or 1), the alkylene group may have an oxygen bond (ether bond) in the main chain; and  
 (B) a compound generating an acid under irradiation with radiation, in an organic solvent, wherein the content of an acid component is 10 ppm or less.

3. **(Original)** A chemical amplification type positive photoresist composition prepared by dissolving:

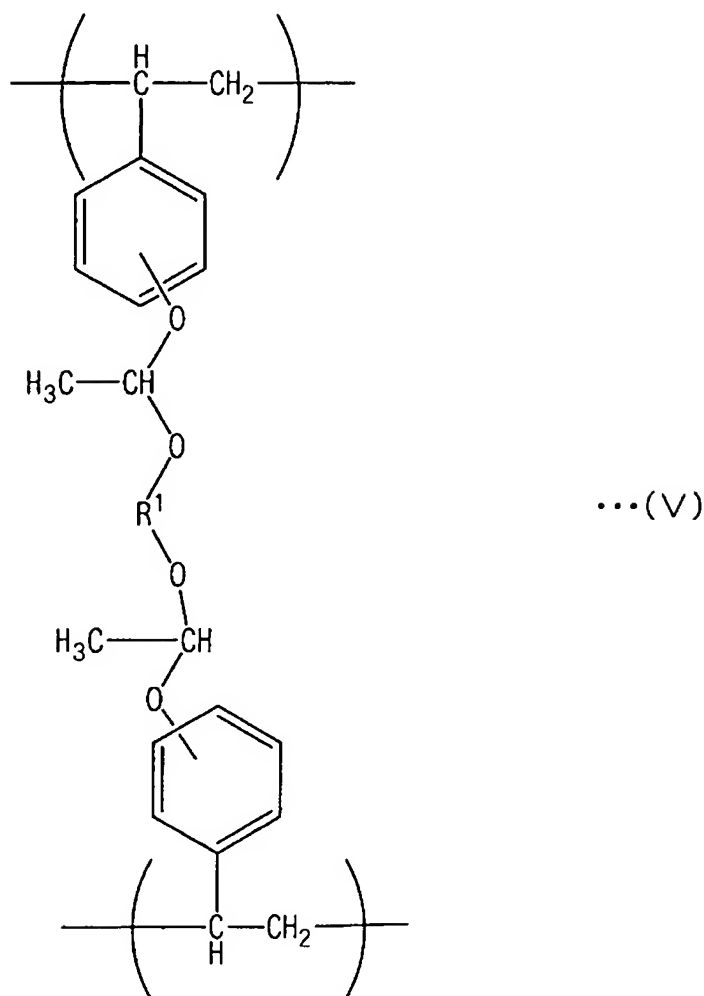
(A'') a slightly alkali-soluble or alkali-insoluble polyhydroxystyrenic resin having such a property that solubility in an aqueous alkali solution is enhanced in the presence of an acid, comprising

either or both of a constituent unit (a'1) represented by the following general formula



(IV):

wherein  $R^1$  represents either an alkylene group having 1 to 10 carbon atoms which may have a substituent or a group represented by the above general formula (II) (wherein  $R^4$  represents an alkylene group having 1 to 10 carbon atoms which may have a substituent and  $m$  represents 0 or 1), the alkylene group may have an oxygen bond (ether bond) in the main chain, and an intermolecular crosslinked moiety (a'2) represented by the following general formula (V):



wherein  $R^1$  represents either an alkylene group having 1 to 10 carbon atoms which may have a substituent or a group represented by the above general formula (II) (wherein  $R^4$  represents an alkylene group having 1 to 10 carbon atoms which may have a substituent and  $m$  represents 0 or 1), the alkylene group may have an oxygen bond (ether bond) in the main chain, and a styrenic constituent unit; and

(B) a compound generating an acid under irradiation with radiation, in an organic solvent.

4. **(Original)** The chemical amplification type positive photoresist composition according to any one of claims 1 to 3, wherein the component (B) is a compound generating an acid under irradiation with i-rays (365 nm).

5. **(Original)** The chemical amplification type positive photoresist composition according to any one of claims 1 to 3, which further comprises a basic compound as the component (C).

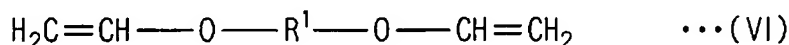
6. **(Original)** The chemical amplification type positive photoresist composition according to claim 5, which comprises the component (C) in the amount of 0.01 to 5 parts by weight based on 100 parts by weight of the resin component contained in the resist composition.

7. **(Original)** The chemical amplification type positive photoresist composition according to any one of claims 1 to 3, which comprises  $\gamma$ -butyrolactone.

8. **(Original)** The chemical amplification type positive photoresist composition according to any one of claims 1 to 3, which is used for a thick-film photolithography process used for forming a resist film having a thickness of about 2 to 7  $\mu\text{m}$ .

9. **(Original)** The chemical amplification type positive photoresist composition according to claim 8, wherein the thick-film photolithography process is used for forming a resist pattern for implantation.

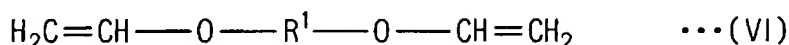
10. **(Original)** A method for synthesis of the component (A) of claim 1, which comprises reacting a novolak resin with a crosslinking agent represented by the following general formula



(VI):

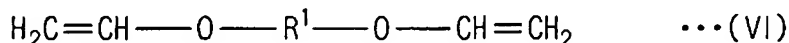
wherein  $\text{R}^1$  represents either an alkylene group having 1 to 10 carbon atoms which may have a substituent or a group represented by the above general formula (II) (wherein  $\text{R}^4$  represents an alkylene group having 1 to 10 carbon atoms which may have a substituent and  $m$  represents 0 or 1, and the alkylene group may have an oxygen bond (ether bond) in the main chain, in the substantial absence of an acid catalyst.

11. **(Original)** A method for synthesis of the component (A') of claim 2, which comprises reacting a hydroxystyrenic resin with a crosslinking agent represented by the following general formula (VI):



wherein  $\text{R}^1$  represents either an alkylene group having 1 to 10 carbon atoms which may have a substituent or a group represented by the above general formula (II) (wherein  $\text{R}^4$  represents an alkylene group having 1 to 10 carbon atoms which may have a substituent and  $m$  represents 0 or 1, and the alkylene group may have an oxygen bond (ether bond) in the main chain, in the presence of an acid catalyst.

12. **(Original)** A method for synthesis of the component (A'') of claim 3, which comprises reacting a hydroxystyrenic resin with a crosslinking agent represented by the following general formula (VI):



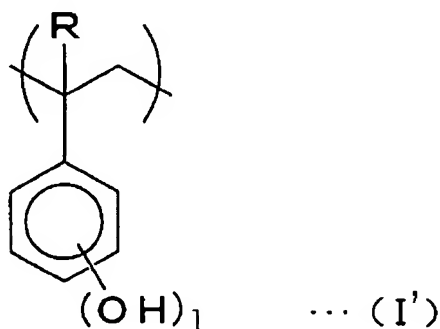
wherein  $\text{R}^1$  represents either an alkylene group having 1 to 10 carbon atoms which may have a substituent or a group represented by the above general formula (II) (wherein  $\text{R}^4$  represents an alkylene group having 1 to 10 carbon atoms which may have a substituent and  $m$  represents 0 or 1, and the alkylene group may have an oxygen bond (ether bond) in the main chain, in the presence of an acid catalyst.

13. **(Original)** A method for formation of a resist pattern of a thick-film photolithography process, which comprises forming a resist film having a thickness of 2 to 7  $\mu\text{m}$  made of the chemical amplification type positive resist composition of any one of claims 1 to 3 on a substrate, and subjecting to selective exposure, post exposure bake (PEB) treatment, and development.

14. **(Original)** The method for formation of a resist pattern according to claim 13, wherein a resist pattern for implantation is formed in the thick-film photolithography process.

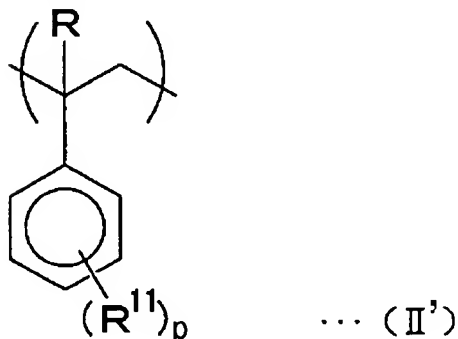
15. **(Original)** A chemical amplification type positive photoresist composition comprising (A2) a resin made of a reaction product of (A1) an alkali soluble resin and (C1) a crosslinking polyvinyl ether compound wherein alkali solubility enhances by an action of an acid, and (B1) a photo acid generator generating acid under irradiation with radiation, wherein

the component (A1) comprises a unit (a1') derived from ( $\alpha$ -methyl)hydroxystyrene represented by the following general formula (I'):



wherein R represents a hydrogen atom or a methyl group and l represents an integer of 1 to 3, and an alkali-insoluble unit (a2') having no acid dissociable dissolution inhibiting group, and wherein a dissolution rate of the component (A1) to an aqueous 2.38% by weight solution of TMAH (tetramethylammonium hydroxide) is from 10 to 100 nm/second.

16. **(Original)** The chemical amplification type positive photoresist composition according to claim 15, wherein the constituent unit (a2') is a unit derived from ( $\alpha$ -methyl)styrene represented by the following general formula (II'):



wherein R represents a hydrogen atom or a methyl group, R<sup>11</sup> represents an alkyl group having 1 to 5 carbon atoms and p represents an integer of 0 or 1 to 3.



17. **(Original)** The chemical amplification type positive photoresist composition according to claim 16, wherein the content of constituent unit (a2') in the component (A1) is from 5 to 35 mol%.

18. **(Original)** The chemical amplification type positive photoresist composition according to claim 15, wherein the weight-average molecular weight of the component (A2) is from 20000 to 150000.

19. **(Original)** The chemical amplification type positive photoresist composition according to claim 15, wherein the component (B1) is a photo acid generator having a decomposition point of 120°C or higher.

20. **(Original)** The chemical amplification type positive photoresist composition according to claim 19, wherein the component (B1) is a poly(bissulfonyl)diazomethane photo acid generator.

21. **(Original)** The chemical amplification type positive photoresist composition according to claim 15, which further comprises a nitrogen-containing organic compound (D').

22. **(Original)** A resist pattern forming method, which comprises applying the chemical amplification type positive photoresist composition of claim 15 on a substrate, and subjecting to prebaking, selective exposure, PEB (post exposure bake) and alkali development to form a resist pattern.